

## **REMARKS**

The present amendment is submitted in response to the Final Office Action mailed December 4, 2007. Claims 49-88 are currently pending in the application. No new matter or issues are believed to be introduced by this amendment. In view of the remarks to follow, reconsideration and allowance of this application are respectfully requested. Applicants appreciate the courtesy granted by Examiner Michael A. Lyons to Applicant's Attorneys, George M. Kaplan (Reg. No, 28,375), and Michael A. Scaturro (Reg. No. 51,356), during a telephonic interview conducted on Thursday, May 01, 2008. During the telephonic interview, the 35 U.S.C. §103 rejection was discussed. Specifically, Applicant's Attorneys presented arguments distinguishing the present invention from the applied art.

### ***Objections to the Specification***

In the Final Office Action, the Specification was objected to for a non-descriptive title. The title has been replaced with a new title as per the Examiner's recommendation. It is believed the new title is clearly indicative of the invention to which the claims are directed.

In the Final Office Action, the abstract of the disclosure was objected to because it fails to provide a concise statement of the technical disclosure. A new Abstract is provided in a manner which is believed to overcome the objection.

In the Final Office Action, the Examiner objects to paragraphs 97, 108, 127, 162 and 187 of the published application for including the phrase "by the claimed methods of calculation." The Examiner states the methods of calculation must be

incorporated into the specification in order to provide antecedent basis for the claims to avoid adding new matter. Applicant respectfully points out support for the phrase “by the claimed methods of calculation” as recited in paragraphs 97, 108, 127, 162 and 187 of the specification can be found throughout the specification and in particular at paragraphs 32 – 33, 49 – 71, 98, 111 and 170. More particularly, the cited paragraphs provide explicit support for method claims 81 – 87.

In the Final Office Action, the Examiner states that the term “dieder” at paragraph 173 has not been translated. Dieder is a greek term that generally translates to “an apparatus having two surfaces.” In the field of optics, “dieder” refers to a 90 degree combination of two mirrors, i.e., a ”right angle prism” representing a two-dimensional retro-reflector, as compared to a corner cube mirror representing a full 3D retroreflector.

In the Final Office Action, the Examiner states the amendment filed on September 30, 2007 introduced new matter into the disclosure. In particular, it is asserted the subfield or sub field, or the phrase “changing the shape or a direction of propagation of the wavefront of at least one of said subfields in dependence on the wavelength,” are not present in the original disclosure. In response, it is respectfully submitted the terms “partial field” and “subfield” are interchangeable, where each term relates to a partial light field resulting from splitting an incoming light field. Applicant has amended the specification and claims to substitute every instance of “subfield” and “sub field” for the term “partial field.” Withdrawal of the objection is respectfully requested.

### ***Claim Objections***

In the Office Action, claims 50, 59, 67-69, 71, 77 and 86 were objected to under CFR 1.75 (c). In particular, claims 50, 68 and 69 were objected to for having no antecedent basis for the term “said modified interference pattern”. Claims 50, 59, 67-69, 71, 77 and 86 have been amended in a manner which is believed to obviate the objection. Specifically, Claims 50, 68 and 69 have been amended to remove the term “modified.” Claims 59, 67-69, 71, 77 and 86 have been amended to remove minor informalities.

### ***Claim Rejections – 35 USC 112, first paragraph***

Claims 49 – 88 were rejected under 35 U.S.C. §112, first paragraph as failing to comply with the written description requirement. In particular, claims 49 – 88 allegedly contain subject matter which was not described in the specification in such a way to reasonably convey to one skilled in the art that the inventor, at the time the application was filed, had possession of the claimed invention.

Claims 49 and 81 were rejected under 35 USC §112 first paragraph because the original specification and claims allegedly fail to disclose a “means for changing one of a shape or a direction of propagation of the wavefront” which is therefore new matter. Claims 49 and 81 have been amended in a manner believed to overcome the rejection.

Claims 49 – 88 were rejected under 35 USC §112 first paragraph because the original specification and claims fail to disclose the term “subfield”. Claims 49 – 88 have been amended in a manner believed to overcome the rejection.

Claim 81 was rejected under 35 USC §112 first paragraph because the original specification and claims fail to disclose the term “discriminative wavelengths”. Claim 81 has been amended in a manner believed to overcome the rejection.

Claim 83 was rejected under 35 USC §112 first paragraph because the original specification and claims fail to disclose the term “decomposition of said numerical representation of said interference pattern.” Claim 83 has been amended in a manner believed to overcome the rejection.

***Claim Rejections – 35 USC 112, second paragraph***

Claims 54, 62 and 87 were rejected under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 54 was rejected for allegedly being in conflict with claim 52. In claim 52, the detection means includes the mask, while in claim 54 the detection means is combined with the mask. Applicant has canceled claim 54 in response.

Claim 62 was rejected for containing an improper Markush Group. Claim 62 has been amended in a manner believed to overcome the rejection.

Claim 87 was rejected for allegedly being in conflict with claim 81. Claim 87 has been amended in a manner believed to overcome the rejection.

**35 U.S.C. §103(a)**

Claims 49 – 88 were rejected under 35 U.S.C. §103(a) as being unpatentable over (WO00062026) to Weitzel in view of U.S. Patent No. 5,933,235 to Sampei et al.

Applicant wishes to point out all reference to Weitzel are made with respect to the corresponding US Patent, No. 7,330,267 (Weitzel), the English equivalent to (WO00062026) Weitzel applied in the Final Office Action.

With regard to claim 49, 57, 58 and 81, the Examiner alleges that Weitzel teaches all of the claim elements, but fails to teach means for coupling in a single spatial mode of an incoming light field to be examined. The Examiner cites Sampei et al. for allegedly curing this deficiency in Weitzel. In particular, the Examiner alleges Sampei et al. teaches at Col. 3, lines 37 – 40, coupling into an interferometer, a light field to be examined with a single spatial mode. The Examiner asserts mode selection is performed in Sampei et al. using a spatial filter 11 or a single mode optical fiber, as allegedly taught in Sampei et al. at Col. 3, line 39. The Examiner further asserts that by using a single mode of the incoming light field, a Gaussian intensity distribution of the wavefront is obtained.

Applicant respectfully disagrees. Sampei et al. teach, inter alia, a spectrometer comprising incident port means for receiving light to be measured. The optical spectrometer of Sampei et al. is based on a different principle of operation than the interferometer of the invention. More particularly, the spectrometer of Sampei et al. is not an interferometer nor are Sampei et al. configured to split beams, superimpose partial light fields, or remotely perform any other function taught by the present invention.

Instead Sampei et al. teach an incoming light is focused on detection means which is incompatible with generation of an interference pattern. It is therefore shown that the apparatus of Sampei et al. is wholly incompatible with interferometric effects for the purpose of creating an interference pattern. In fact, if such an interference pattern

were operative in Sampei et al., it would immediately destroy the smooth distribution of power over the detectors assumed by Sampei et al. as a presupposition for performing the calculations described in Sampei et al..

Further support for Applicant's assertion that Sampei et al. do not teach means for coupling in a single spatial mode of an incoming light field to be examined can be found throughout the specification and in particular at Col. 1, lines 35-40, where it states that the light under investigation is an assemblage of monochromatic light rays (light whose spectral linewidth is much narrower than the resolution of the instrument such as laser light).... and which can find the center wavelength of the monochromatic light and the total power by performing simple arithmetic operations from the outputs from adjacent devices of a device array. The simple arithmetic operations for finding the total power include applying numerical integration techniques. Col. 4, lines 28-30 teaches that the simple arithmetic techniques for finding the total power include applying numerical integration to the above integration.

In the Final Office Action, the Examiner makes particular reference to the sole mention of a "single mode fibre" at Col. 3, lines 37 – 40. It should be understood that Sampei et al. at Col. 3, lines 37 – 40 in fact refers to a "single mode fibre" as an arbitrary example of a source of a Gaussian light field, i.e., a light field having a Gaussian intensity distribution.

Col. 3, lines 37 – 40 of Sampei et al. recites: Where the light intensity distribution  $g(x_i, \dots)$  at the incident port is of the Gaussian type in the same way as in the case of incidence on a single-mode fiber, if the total power is assumed to be 1, then we have.....

Sampei et al. make reference to a “single-mode fiber” to explain an algorithm for calculating a spectral transfer function of a spectrometer, especially for the integration over the incident port. In accordance with the explanation, Sampei et al. use the notion of Gaussian fields, exemplified by the “single-mode fiber”. By carrying out a continuous integration, according to the algorithm, Sampei et al. clearly teach by implication that the incident port **does not represent a single mode** but must be approximated by an infinite sum of such modes.

In making the rejection, the Examiner further cites Weitzel for providing motivation for the modification of a “single-mode fiber”. In particular, the Examiner cites Weitzel at page 17 for teaching that a sufficiently small entrance surface is desirable. However, the Examiner admits that Weitzel provides no specific parameters for the sufficiently small size.

It is respectfully submitted that the cited reference, Weitzel (US 7,330,267), hereinafter ‘267, teaches the use of an entry slit in combination with a collimating lens to get a collimated beam of light. By using collimation and placing optical dispersive elements in the Fourier plane of a collimating lens, the adverse effects of the width of the entry slit are minimized. It is well known that all conventional spectrometers, including the one used by Sampei et al., use this approach. The use of collimation is taught throughout Weitzel ‘267 and in particular at Col. 4, lines 45 and 67, Col. 6, line 20, Col. 5, line 53 and claims 22 and 23.

In sharp contrast, the present invention uses the infinite spatial coherence of an optical monomode which not only avoids the adverse effects of the width of an entry slit, but in addition precludes the need for a collimating lens. As shown in the drawings, there

is no requirement or need to place optical elements at certain distances from each other which consequentially allows for the novel optical setups described by the invention.

Accordingly, in view of the forgoing amendment, accompanying remarks and telephone interview in the above-identified application, it is respectfully submitted all claims pending herein are in condition for allowance. Please contact the undersigned attorney should there be any questions. A petition for an automatic two month extension of time for response under 37 C.F.R. §1.136(a) is enclosed in triplicate together with the requisite petition fee, RCE transmittal papers and RCE filing fee.

Early favorable action is earnestly solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "G. M. Kaplan", written over a horizontal line.

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